

## CHAPTER II

## Preliminary Classification:

Proposed Class:

Subclass:

NOTE: "All applicants are requested to include a preliminary classification on newly filed patent applications. The preliminary classification, preferably class and subclass designations, should be identified in the upper right-hand corner of the letter of transmittal accompanying the application papers, for example 'Proposed Class 2, subclass 129.'" M.P.E.P., § 601, 7th ed.

**TRANSMITTAL LETTER  
TO THE UNITED STATES ELECTED OFFICE (EO/US)  
(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)**

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP00/03324	13 April 2000	8 May 1999
TITLE OF INVENTION		

DEVICE FOR HANDLING SUBSTRATES INSIDE AND OUTSIDE A CLEAN ROOM

## APPLICANT(S)

Wolfgang SCHMUTZ, Josef GENTISCHER

## Box PCT

Assistant Commissioner for Patents

Washington D.C. 20231

ATTENTION: EO/US

**CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10\***

(When using Express Mail, the Express Mail label number is mandatory;  
Express Mail certification is optional.)

I hereby certify that, on the date shown below, this correspondence is being:

**MAILING**

- ☒ deposited with the United States Postal Service in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231

37 C.F.R. § 1.8(a)

37 C.F.R. § 1.10 \*

- ☐ with sufficient postage as first class mail.

- ☒ as "Express Mail Post Office to Addressee"

Mailing Label No. E1627511049US (mandatory)**TRANSMISSION**

- ☐ facsimile transmitted to the Patent and Trademark Office, (703) \_\_\_\_\_

Signature

Shauna Murphy

(type or print name of person certifying)

\* Only the date of filing (§ 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under § 1.8 continues to be taken into account in determining timeliness. See § 1.703(f). Consider "Express Mail Post Office to Addressee" (§ 1.10) or facsimile transmission (§ 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.

(Transmittal Letter to the United States Elected Office (EO/US) [13-18]—page 1 of 9)

**NOTE:** To avoid abandonment of the application, the applicant shall furnish to the USPTO, not later than 20 months from the priority date: (1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the USPTO; and (2) the basic national fee (see 37 C.F.R. § 1.492(a)). The 30-month time limit may not be extended. 37 C.F.R. § 1.495.

**WARNING:** Where the items are those which can be submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. § 1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing—See 37 C.F.R. § 1.8.

**NOTE:** Documents and fees must be clearly identified as a submission to enter the national state under 35 U.S.C. § 371 otherwise the submission will be considered as being made under 35 U.S.C. § 111. 37 C.F.R. § 1.494(f).

- I. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. § 371:
- a. ☒ This express request to immediately begin national examination procedures (35 U.S.C. § 371(f)).
  - b. ☒ The U.S. National Fee (35 U.S.C. § 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

## 2. Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
<input type="checkbox"/>	TOTAL CLAIMS				
	16	16 - 20 =	0	× \$18.00 =	\$ 0
	INDEPENDENT CLAIMS				
	1	1 - 3 =	0	× \$84.00 =	0
	MULTIPLE DEPENDENT CLAIM(S) (if applicable) +\$ 280.00 =				
BASIC FEE**	<input type="checkbox"/> U.S. PTO WAS INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the U.S. PTO: <input type="checkbox"/> and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness) and industrial activity, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims presented in the application entering the national stage (37 C.F.R. § 1.492(a)(4)) ..... \$100.00 <input type="checkbox"/> and the above requirements are not met (37 C.F.R. § 1.492(a)(1)) ..... \$ 710.00 <input checked="" type="checkbox"/> U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where no international preliminary examination fee as set forth in § 1.482 has been paid to the U.S. PTO, and payment of an international search fee as set forth in § 1.445(a)(2) to the U.S. PTO: <input type="checkbox"/> has been paid (37 C.F.R. § 1.492(a)(2)) ..... \$ 740.00 <input type="checkbox"/> has not been paid (37 C.F.R. § 1.492(a)(3)) ..\$1,040.00 <input checked="" type="checkbox"/> where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 C.F.R. § 1.492(a)(5) ) ..... \$ 890.00				
	Total of above Calculations				= 890.00
SMALL ENTITY	Reduction by 1/2 for filing by small entity, if applicable. Assertion must be made. (note 37 C.F.R. § 1.27)				-
	Subtotal				890.00
	Total National Fee				\$ 890.00
	Fee for recording the enclosed assignment document \$40.00 (37 C.F.R. § 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed				\$ 890.00

- ☒ Attached is a ☒ check ☐ money order in the amount of \$ 890.00
- ☐ Authorization is hereby made to charge the amount of \$ \_\_\_\_\_
- ☒ to Deposit Account No. 16-1350
- ☐ to Credit card as shown on the attached credit card information authorization form PTO-2038.

**WARNING:** Credit card information should **not** be included on this form as it may become public.

- ☒ Charge any additional fees required by this paper or credit any overpayment in the manner authorized above.

A duplicate of this paper is attached.

**\*\*WARNING:** "To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: \* \* \* (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).

**WARNING:** *If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.*

- ☐ Assertion of Small Entity Status
- ☐ Applicant hereby asserts status as a small entity under 37 C.F.R. § 1.27.

*NOTE: 37 C.F.R. § 1.27(c) deals with the assertion of small entity status, whether by a written specific declaration thereof or by payment as a small entity of the basic filing fee or the fee for the entry into the national phase as states:*

*"(c) Assertion of small entity status. Any party (person, small business concern or nonprofit organization) should make a determination, pursuant to paragraph (f) of this section, of entitlement to be accorded small entity status based on the definitions set forth in paragraph (a) of this section, and must, in order to establish small entity status for the purpose of paying small entity fees, actually make an assertion of entitlement to small entity status, in the manner set forth in paragraphs (c)(1) or (c)(3) of this section, in the application or patent in which such small entity fees are to be paid.*

(1) *Assertion by writing.* Small entity status may be established by a written assertion of entitlement to small entity status. A written assertion must:

- (i) Be clearly identifiable;
  - (ii) Be signed (see paragraph (c)(2) of this section); and
  - (iii) Convey the concept of entitlement to small entity status, such as by stating that applicant is a small entity, or that small entity status is entitled to be asserted for the application or patent. While no specific words or wording are required to assert small entity status, the intent to assert small entity status must be clearly indicated in order to comply with the assertion requirement.
- c) Parties who can sign and file the written assertion. The written assertion can be signed by:
- (i) One of the parties identified in §§ 1.33(b) (e.g., an attorney or agent registered with the Office), §§ 3.73(b) of this chapter notwithstanding, who can also file the written assertion;
  - (ii) At least one of the individuals identified as an inventor (even though a §§ 1.63 executed oath or declaration has not been submitted), notwithstanding §§ 1.33(b)(4), who can also file the written assertion pursuant to the exception under §§ 1.33(b) of this part; or
  - (iii) An assignee of an undivided part interest, notwithstanding §§ 1.33(b)(3) and 3.73(b) of this chapter, but the partial assignee cannot file the assertion without resort to a party identified under §§ 1.33(b) of this part.

(3) Assertion by payment of the small entity basic filing or basic national fee. The payment, by any party, of the exact amount of one of the small entity basic filing fees set forth in §§ 1.16(a), (f), (g), (h), or (k), or one of the small entity basic national fees set forth in §§ 1.492(a)(1), (a)(2), (a)(3), (a)(4), or (a)(5), will be treated as a written assertion of entitlement to small entity status even if the type of basic filing or basic national fee is inadvertently selected in error.

(i) If the Office accords small entity status based on payment of a small entity basic filing or basic national fee under paragraph (c)(3) of this section that is not applicable to that application, any balance of the small entity fee that is applicable to that application will be due along with the appropriate surcharge set forth in §§ 1.16(e), or §§ 1.16(f).

(ii) The payment of any small entity fee other than those set forth in paragraph (c)(3) of this section (whether in the exact fee amount or not) will not be treated as a written assertion of entitlement to small entity status and will not be sufficient to establish small entity status in an application or a patent."

3. ☒ A copy of the International application as filed (35 U.S.C. § 371(c)(2)):

NOTE: Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment. "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40, at 35-36. See item 14c below.

- a. ☐ is transmitted herewith.
- b. ☐ is not required, as the application was filed with the United States Receiving Office.
- c. ☒ has been transmitted
  - i. ☒ by the International Bureau.

Date of mailing of the application (from form PCT/1B/308):

11/16/00

- ii. ☐ by applicant on \_\_\_\_\_. (Date)

4. ☒ A translation of the International application into the English language (35 U.S.C. § 371(c)(2)):

- a. ☒ is transmitted herewith.
- b. ☐ is not required as the application was filed in English.
- c. ☐ was previously transmitted by applicant on \_\_\_\_\_. (Date)
- d. ☐ will follow.

5. ☒ Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. § 371(c)(3)):

NOTE: The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.

- a. ☐ are transmitted herewith.
- b. ☐ have been transmitted
- i. ☐ by the International Bureau.

Date of mailing of the amendment (from form PCT/1B/308):

- ii. ☐ by applicant on \_\_\_\_\_. (Date)
- c. ☒ have not been transmitted as
- i. ☒ applicant chose not to make amendments under PCT Article 19.  
Date of mailing of Search Report (from form PCT/ISA/210.):  
8/22/00
- ii. ☐ the time limit for the submission of amendments has not yet expired. The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.

6. ☒ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. § 371(c)(3)):
- a. ☐ is transmitted herewith.
  - b. ☐ is not required as the amendments were made in the English language.
  - c. ☒ has not been transmitted for reasons indicated at point 5(c) above.
7. ☒ A copy of the international examination report (PCT/IPEA/409)
- ☒ is transmitted herewith.
  - ☐ is not required as the application was filed with the United States Receiving Office.
8. ☒ Annex(es) to the international preliminary examination report
- a. ☒ is/are transmitted herewith.
  - b. ☐ is/are not required as the application was filed with the United States Receiving Office.
9. ☒ A translation of the annexes to the international preliminary examination report
- a. ☒ is transmitted herewith.
  - b. ☐ is not required as the annexes are in the English language.

(Transmittal Letter to the United States Elected Office (EO/US) [13-18]—page 6 of 9)

10. ☒ An oath or declaration of the inventor (35 U.S.C. § 371(c)(4)) complying with 35 U.S.C. § 115
- a. ☐ was previously submitted by applicant on \_\_\_\_\_. (Date)
  - b. ☐ is submitted herewith, and such oath or declaration
    - i. ☐ is attached to the application.
    - ii. ☐ identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. § 1.70.
  - c. ☒ will follow.

II. Other document(s) or information included:

11. ☒ An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):
- a. ☒ is transmitted herewith.
  - b. ☐ has been transmitted by the International Bureau.  
Date of mailing (from form PCT/IB/308): \_\_\_\_\_
  - c. ☐ is not required, as the application was searched by the United States International Searching Authority.
  - d. ☐ will be transmitted promptly upon request.
  - e. ☐ has been submitted by applicant on \_\_\_\_\_. (Date)
12. ☒ An Information Disclosure Statement under 37 C.F.R. §§ 1.97 and 1.98:
- a. ☒ is transmitted herewith.

Also transmitted herewith is/are:

- ☒ Form PTO-1449 (PTO/SB/08A and 08B).
  - ☒ Copies of citations listed.
  - b. ☐ will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. § 371(c).
  - c. ☐ was previously submitted by applicant on \_\_\_\_\_. (Date)
13. ☐ An assignment document is transmitted herewith for recording.
- A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

14. ☒ Additional documents:
- a. ☒ Copy of request (PCT/RO/101)
  - b. ☒ International Publication No. WO 00/68976
    - i. ☒ Specification, claims and drawing
    - ii. ☐ Front page only
  - c. ☒ Preliminary amendment (37 C.F.R. § 1.121)
  - d. ☒ Other  
Verified English Translation of WO Publication, PCT/IB/308,  
Written Opinion Response, Preliminary Examination Report and English  
translation thereof.
15. ☒ The above checked items are being transmitted
- a. ☒ before 30 months from any claimed priority date.
  - b. ☐ after 30 months.
16. ☐ Certain requirements under 35 U.S.C. § 371 were previously submitted by the applicant on \_\_\_\_\_, namely:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

#### AUTHORIZATION TO CHARGE ADDITIONAL FEES

**WARNING:** Accurately count claims, especially multiple dependant claims, to avoid unexpected high charges if extra claims are authorized.

**NOTE:** "A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

**NOTE:** "Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

- ☒ Please charge, in the manner authorized above, the following additional fees that may be required by this paper and during the entire pendency of this application:
- ☒ 37 C.F.R. § 1.492(a)(1), (2), (3), and (4) (filing fees)

**WARNING:** Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.

(Transmittal Letter to the United States Elected Office (EO/US) [13-18]—page 8 of 9)



- ☒ 37 C.F.R. § 1.492(b), (c) and (d) (presentation of extra claims)

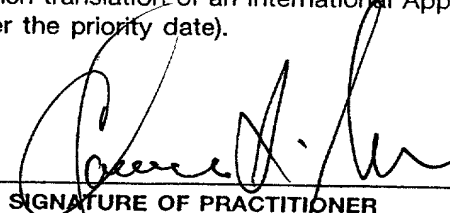
NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.

- ☒ 37 C.F.R. § 1.17 (application processing fees)
- ☒ 37 C.F.R. § 1.17(a)(1)-(5) (extension fees pursuant to § 1.136(a).
- ☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. § 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

- ☒ 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).



SIGNATURE OF PRACTITIONER

Clarence A. Green

(type or print name of practitioner)

PERMAN & GREEN, LLP

P.O. Address

425 Post Road, Fairfield, CT 06430 USA

Reg. No.: 24,622

Tel. No.: (203 ) 259-1800

Customer No.: 2512

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Express Mail No.: EL627511049US

In re Application of: SCHMUTZ et al.

INTERNATIONAL APPLICATION NO.: PCT/EP00/03324

INTERNATIONAL FILING DATE: 4/13/00

TITLE: DEVICE FOR HANDLING SUBSTRATES INSIDE AND OUTSIDE A  
CLEAN ROOM

ATTORNEY DOCKET NO.: 390-010641-US(PCT)

Box PCT

The Commissioner of Patents and Trademarks  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Please amend the above-identified, patent application as follows:

IN THE SPECIFICATION:

After the Title and before the first paragraph, please insert the following new paragraph:

This application claims the benefit of the earlier filed International Application No. PCT/EP00/03324, International Filing Date, April 13, 2000, which designated the United States of America, and which international application was published under PCT Article 21(2) in German as WO Publication No. WO 00/68976.

IN THE CLAIMS

Please amend Claims 1, 4, 5, 6, 7, 8, 9, 11, 13, 15 and 16 as rewritten below:

1. Device (10) for manipulating substrates (11) inside and outside an ultraclean workroom (15) with a sluice device (17), provided between a storage room (20) and the ultraclean workroom (15) by means of which a substrate cassette (12) accommodated under ultraclean room conditions in a box (13) can be removed from box (13) or reintroduced into this box, and with a first manipulating device (51) by means of which substrates (11) can be placed in cassette (12) and can be removed from this cassette, is hereby characterized in that the storage room (20) for a multiple number of cassette boxes (13) is accommodated in row and/or column arrangement on substantially the entire ultraclean workroom.

4. Device according to claim 1, further characterized in that sluice device (17) is arranged in the floor (24) of storage room (20) or of the ceiling of ultraclean workroom (15).

5. Device according to claim 3, further characterized in that the sluice door is formed by platform (63) of cassette box (13).

6. Device according to claim 1, further characterized in that sluice device (17) is arranged in a side wall of ultraclean workroom (15).

7. Device according to claim 3, further characterized in that sluice door (67) is formed in a hood (64) of cassette box (13).

8. Device according to claim 2, further characterized in that a lifting device (47) for substrate cassette (12) or cassette box (13) is assigned to each locking unit (18).

9. Device according to claim 1, further characterized in that ultraclean workroom (15) is provided with several working chambers (42 to 44) for processing, manufacturing, testing, sorting and/or like procedures, between which, arranged underneath, and/or between these and the one or more sites of substrate cassettes (12), the first manipulating device (51) is provided.

11. Device according to claim 1, further characterized in that storage room (20) is provided with storage spaces (28, 29) in row and/or column arrangement, between which, arranged underneath and/or between locking units (18) of sluice device (17) and/or between storage spaces (28, 29) and locking units (18), a second manipulating device (31) is provided, by means of which cassette boxes (13) can be displaced.

13. Device according to claim 1, further characterized in that storage room (20) is provided with one or more input/output openings (22, 23) for cassette boxes (13).

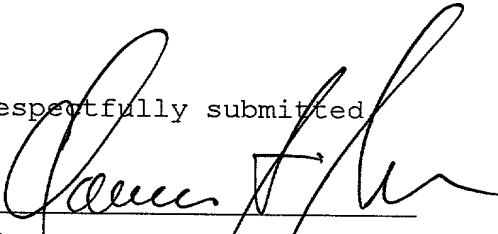
15. Device according to claim 13, further characterized in that a manual or automatic loading device is assigned to the input/output openings.

16. Device according to claim 1, further characterized in that manipulating device (31, 51) is provided with a fork or gripper unit.

#### REMARKS

In accordance with 37 C.F.R. §1.121 (as amended on 11/7/2000) the rewritten claim(s) above are shown on separate page(s) marked up to show all the changes relative to the previous version of that section.

Respectfully submitted

  
 Clarence A. Green      Reg. No.: 24,622  
 PERMAN & GREEN, LLP  
 425 Post Road, Fairfield, CT 06430  
 (203) 259-1800  
 Customer No.: 2512

  
 Date

Application entitled: DEVICE FOR HANDLING SUBSTRATES INSIDE  
AND OUTSIDE A CLEAN ROOM

MARKED UP CLAIM(S)

1. Device (10) for manipulating substrates (11) inside and outside an ultraclean workroom (15) with a sluice device (17), provided between a storage room (20) and the ultraclean workroom (15) by means of which a substrate cassette (12) accommodated under ultraclean room conditions in a box (13) can be removed from box (13) or reintroduced into this box, and with a first manipulating device (51) by means of which substrates (11) can be placed in cassette (12) and can be removed from this cassette, is hereby characterized in that athe storage room (20) for a multiple number of cassette boxes (13) is accommodated in row and/or column arrangement on substantially the entire ultraclean workroom.~~en or above the ultraclean workroom (15) and that sluice device (17) is provided between storage room (20) and ultraclean workroom (15).~~

4. Device according to ~~at least one of claims 1 to 3~~, further characterized in that sluice device (17) is arranged in the floor (24) of storage room (20) or of the ceiling of ultraclean workroom (15).

5. Device according to claims 3 ~~and 4~~, further characterized in that the sluice door is formed by platform (63) of cassette box (13).

6. Device according to ~~at least one of claims 1 to 3~~, further characterized in that sluice device (17) is arranged in a side wall of ultraclean workroom (15).

7. Device according to ~~claims 3 and 6~~, further characterized in that sluice door (67) is formed in a hood (64) of cassette box (13).

8. Device according to ~~at least one of claims 2 to 7~~, further characterized in that a lifting device (47) for substrate cassette (12) or cassette box (13) is assigned to each locking unit (18).

9. Device according to ~~at least one of the preceding claims 1~~, further characterized in that ultraclean workroom (15) is provided with several working chambers (42 to 44) for processing, manufacturing, testing, sorting and/or like procedures, between which, arranged underneath, and/or between these and the one or more sites of substrate cassettes (12), the first manipulating device (51) is provided.

11. Device according to ~~at least one of the preceding claims 1~~, further characterized in that storage room (20) is provided with storage spaces (28, 29) in row and/or column arrangement, between which, arranged underneath and/or between locking units (18) of sluice device (17) and/or between storage spaces (28, 29) and locking units (18), a

second manipulating device (31) is provided, by means of which cassette boxes (13) can be displaced.

13. Device according to ~~at least one of the preceding claims~~  
1, further characterized in that storage room (20) is provided with one or more input/output openings (22, 23) for cassette boxes (13).

15. Device according to claim 13 ~~or 14~~, further characterized in that a manual or automatic loading device is assigned to the input/output openings.

16. Device according to ~~at least one of the preceding claims~~  
1, further characterized in that manipulating device (31, 51) is provided with a fork or gripper unit.

2025 RELEASE UNDER E.O. 14176



DEVICE FOR HANDLING SUBSTRATES INSIDE AND OUTSIDE A  
CLEAN ROOM

5

### Description

The present invention concerns a device for manipulating substrates inside and outside an ultraclean workroom according to the preamble of claim 1.

10

In previously known devices of this type, the individual cassette boxes are introduced manually or automatically into the ultraclean workroom, whereupon the substrates are processed inside the ultraclean workroom;

15 subsequently, the cassette boxes provided with the  
processed substrates are brought to another station  
arranged at a distance from the ultraclean workroom.  
The arrangement of various stations of such a device  
takes up a great deal of space and is both time-  
20 consuming and expensive due to the manipulating devices  
that are arranged between the stations.

The object of the present invention is to create a device for manipulating substrates inside and outside an ultraclean workroom of the type named initially, which  
25 can combine various work steps and production steps in a way that saves space.

In order to solve this problem, in a device for manipulating substrates inside and outside an ultraclean workroom of the type named initially, the features given in claim 1 are provided.

5

Since the storage room is arranged above the otherwise unutilized space of the ultraclean workroom, a device for manipulating substrates inside and outside the ultraclean workroom is created in a way that saves  
10 space, and the most varied work steps can be joined together or combined. Since the paths between steps are short, this results in a considerable time savings.

15

Ideally, the substrate cassettes of any type of cassette boxes can be introduced into the ultraclean workroom, processed, or handled in another way, and again placed in the same arrangement or in a new arrangement relative to one another in a cassette box, and, for example, can be stored newly sorted.

20

Additional work steps and time-saving combinations of work steps are then possible, if the features according to claim 2 are provided.

Advantageous embodiments of the locking units of the sluice device are produced by the features of one or more of claims 3 to 7.

- 5 One or more lifting mechanisms are provided according to the features of claim 8, for simple manipulation of the substrate cassettes or cassette boxes.

- According to the features of claim 9, the most varied  
10 work steps can be conducted individually or in combination, such as, for example, process steps, manufacturing steps, testing procedures, and sorting procedures, within the ultraclean workroom. New batches of substrates can also be combined in this way,  
15 according to the testing and/or sorting procedures and placed in the storage room. The first manipulation device embodied according to the features of claim 10 is of particular advantage for this purpose.

- 20 According to the features of claim 11, the storage room is provided with a plurality of storage spaces, which can be achieved by the second manipulation device together with one or more locking units and together with one or more input/output openings for the cassette  
25 boxes according to claim 13. Advantageous embodiments

of this result from the features of one or more of claims 12 and 14 to 16.

Additional individual features of the invention can be  
5 taken from the following description, in which the invention is described and explained in more detail on the basis of the examples of embodiment shown in the drawing. Here:

10 Figure 1 shows in schematic cross-sectional representation a device for manipulating substrates inside and outside an ultraclean workroom according to a preferred example of embodiment of the present invention;

15 Figure 2 shows a partially broken away lateral view according to arrow II of Figure 1; and

Figure 3 shows a representation corresponding to Figure  
20 1, but according to another example of embodiment of the present invention.

Device 10, which is shown in Figures 1 and 2 according to a preferred example of embodiment of the present  
25 invention, serves for manipulating substrates 11 inside and outside an ultraclean workroom 15, wherein

substrates 11 are accommodated, stacked one on top of the other, in a cassette 12, and each cassette 12 is arranged inside a box 13 under ultraclean room conditions.

5

The ultraclean workroom 15 has a housing 16, which has a parallelepiped form, for example, and which is hermetically sealed, and a sluice device 17 with one or more locking units 18. A housing 21 is placed on housing 16 of ultraclean workroom 15, and this housing 21 contains or bounds a storage room 20. The sluice device 17 effects a manipulation transfer between storage room 20 and ultraclean workroom 15, without exchange of atmosphere. Storage room 20 is provided with one or more input/output openings 22, 23, which can be closed by means of a door 30, for introducing or removing cassette boxes 13. In the example of embodiment shown, two input/output openings 22 and 23 arranged next to one another are provided in the vicinity of floor 24 of housing 21. It is understood that input/output openings 22, 23 can be present in greater number and/or can be provided at other places of housing 21, for example, in the vicinity of its ceiling 25. Among other things, this depends on whether input/output openings 22, 23 are operated manually or automatically by means of a loading device.

Housing 21 of storage room 20 is of parallelepiped shape in the example of embodiment shown and thus relatively high and configured such that rows and columns of storage spaces 28 are provided for cassette boxes 13 along both longitudinal sidewalls 26 and 27. A manipulating device 31 for cassette boxes 13 is provided between the two storage space arrangements 28 and 29. The manipulating device 31 has an upright column 32, which is guided longitudinally in floor 24 and in ceiling 25 of housing 21 by means of a linear guide 33, 34. A horizontally movable bent-arm fork 36, the fork ends 37 of which can grasp cassette boxes 13, for example, on top, is guided in the vertical direction at column 32. Manipulating device 31 can thus be moved in three coordinate axes, so that cassette boxes 13 can be moved from the one or more input/output openings 22, 23 to storage spaces 28, 29 and back, and between storage spaces 28, 29 and locking units 18 of sluice device 17.

Several chambers 42, 43, 44, for example, are arranged next to one another on one of the longitudinal sides 41 of housing 16 inside housing 16 for the ultraclean workroom 15. These chambers 42 to 44 may be used as

process chambers, manufacturing chambers, testing  
chambers identification chambers

and/or the like. It is understood that, independent of  
5 the representation shown in the drawing, any number of  
chambers may be provided. On opposite-lying  
longitudinal side 46 of housing 16 for ultraclean  
workroom 15, one or more lifting devices 47 is or are  
provided, which is or are arranged in the region of  
10 locking units 18 of sluice device 17 or below these  
units and one lifting device is assigned to one locking  
unit. Lifting device 47 possesses a rod 48 that can be  
moved up and down, by means of which a substrate  
cassette 12 can be moved up and down.

15  
Between the arrangement of chambers 42 to 44 on one  
longitudinal side 46 and the arrangement of one or more  
lifting devices 47 on the other longitudinal side 46, a  
manipulating device 51 is provided, which can be moved  
20 back and forth in the longitudinal direction of housing  
16 on a linear guide 53 of the floor side. In the  
example of embodiment shown, manipulating device 51 has  
a horizontally movable bent-arm gripper [claw] 56, and  
the gripper end 57 of this claw can transfer substrate  
25 11 between substrate cassette 12 applied on lifting  
device 47, on the one hand, and one or more of chambers  
42 to 44.

In the example of embodiment of Figures 1 and 2, the one or more locking units 18 of sluice device 17 is or are formed at floor 24 of housing 21, which here forms an intermediate wall of housings 16 and 21, provided directly above the arrangement of the one or more lifting devices 47. The locking unit 18 has a rotating support 61, on which can be tightly seated the lower edge 62 of a hood 64 of each cassette box 13. For the sluice-type introduction of substrate cassette 12 into the ultraclean workroom 15, the bottom 63 of the cassette is unlocked from hood 64 of cassette box 13, removed by rod 48 of lifting device 47, and cassette box 13 is lowered to the level of manipulating device 51, so that substrates 11 of cassette 12 can be manipulated. If several lifting devices 47 are provided in the case of several locking units 48 and thus several substrate cassettes 12 are to be manipulated simultaneously or sequentially within the ultraclean workspace 15, the individual substrate cassettes 17 can be newly loaded in a different way, so that new batches can be made up. A substrate cassette 12 is put back into its cassette box 13 in the appropriate reverse manner by means of lifting device 47, whereupon after locking cassette bottom 63 with hood 64, cassette box 13 can be introduced by means



of manipulating device 31 from locking unit 18 to a storage space 28, 29 or into input/output openings 22, 23.

- 5 In the example of embodiment of device 10' shown in Figure 3, the site 59', at which the one or more lifting devices 47' is or are found, in fact, also in the vicinity of a longitudinal side of the housing, but still inside storage space 20', and thus outside
- 10 ultraclean workroom 15, whose sidewall 65 displaced inwardly forms a part of sluice device 17' or of one or more locking units 18'. In this example of embodiment, a complete cassette box 13' is introduced onto lifting device 47' by means of manipulating device 31', and is
- 15 lowered into the region of sidewall 65 or its locking unit 18' by means of the latter. Lifting device 47' is thus configured as a storage space 29 that can be lowered.
- 20 The same number of sluice doors 66 are found in side wall 65 as the number of locking units 18', and each of these doors opens together with a side door 67 in cassette box 13', if cassette box 13' is docked laterally at side wall 65 in a way that seals sluice
- 25 door 66 opposite storage space 20'. After opening doors 66 and 67, substrates 11 can be removed from docked box

13' for manipulating in chambers 42' to 44' and are brought back again into the appropriate box 13'. It is understood that one or more of such lifting devices 47' can be arranged together with locking units 18' along this corridor 59' between the outer wall of the housing and side wall 65. In this example, box 13' cannot be opened via the bottom, but in a region of its hood 64', in order to remove substrates 11.

10 The other components of device 10' (Figure 3) correspond to those of device 10 (Figures 1 and 2), whereby bent-arm fork 36' of manipulation device 31' is adapted to the design of box 13', whose hood 64' is provided with a handle 69 on top.

15

In this way, various steps of production, treatment, testing, classifying, identifying and including storage and new combinations of batches of substrates 11 inside a cassette 12, 12' can be achieved in a unitary device

20 10 or 10'.

## Patent Claims

1. Device (10) for manipulating substrates (11) inside  
and outside an ultraclean workroom (15) with a sluice  
5 device (17), by means of which a substrate cassette (12)  
accommodated under ultraclean room conditions in a box  
(13) can be removed from box (13) or reintroduced into  
this box, and with a first manipulating device (51) by  
means of which substrates (11) can be placed in cassette  
10 (12) and can be removed from this cassette, is hereby  
characterized in that a storage room (20) for a multiple  
number of cassette boxes (13) is accommodated on or  
above the ultraclean workroom (15) and that sluice  
device (17) is provided between storage room (20) and  
15 ultraclean workroom (15).

2. Device according to claim 1, further characterized  
in that sluice device (17) has one or more locking units  
(18) that are independent of one another.

20

3. Device according to claim 2, further characterized in  
that the sluice door of each locking unit (18) is formed  
by a component (63, 67) of cassette box (13).

25 4. Device according to at least one of claims 1 to 3,  
further characterized in that sluice device (17) is

arranged in the floor (24) of storage room (20) or of the ceiling of ultraclean workroom (15).

5. Device according to claims 3 and 4, further  
5 characterized in that the sluice door is formed by platform (63) of cassette box (13).

6. Device according to at least one of claims 1 to 3,  
further characterized in that sluice device (17) is  
10 arranged in a side wall of ultraclean workroom (15).

7. Device according to claims 3 and 6, further  
characterized in that sluice door (67) is formed in a  
hood (64) of cassette box (13).

15 8. Device according to at least one of claims 2 to 7,  
further characterized in that a lifting device (47) for  
substrate cassette (12) or cassette box (13) is assigned  
to each locking unit (18).

20 9. Device according to at least one of the preceding  
claims, further characterized in that ultraclean  
workroom (15) is provided with several working chambers  
(42 to 44) for processing, manufacturing, testing,  
25 sorting and/or like procedures, between which, arranged  
underneath, and/or between these and the one or more

sites of substrate cassettes (12), the first manipulating device (51) is provided.

10. Device according to claim 9, further characterized  
5 in that the first manipulating device (51) at floor (24) of ultraclean workroom (15) is provided with a linear guide (53).

11. Device according to at least one of the preceding  
10 claims, further characterized in that storage room (20) is provided with storage spaces (28, 29) in row and/or column arrangement, between which, arranged underneath and/or between locking units (18) of sluice device (17) and/or between storage spaces (28, 29) and locking units  
15 (18), a second manipulating device (31) is provided, by means of which cassette boxes (13) can be displaced.

12. Device according to claim 11, further characterized  
in that the second manipulating device (31) is provided  
20 on the bottom and/or the cover side with a linear guide (33, 34).

13. Device according to at least one of the preceding  
claims, further characterized in that storage room (20)  
25 is provided with one or more input/output openings (22, 23) for cassette boxes (13).

14. Device according to claim 13, further characterized in that input/output openings (22, 23) can be closed.

5 15. Device according to claim 13 or 14, further characterized in that a manual or automatic loading device is assigned to the input/output openings.

10 16. Device according to at least one of the preceding claims, further characterized in that manipulating device (31, 51) is provided with a fork or gripper unit.

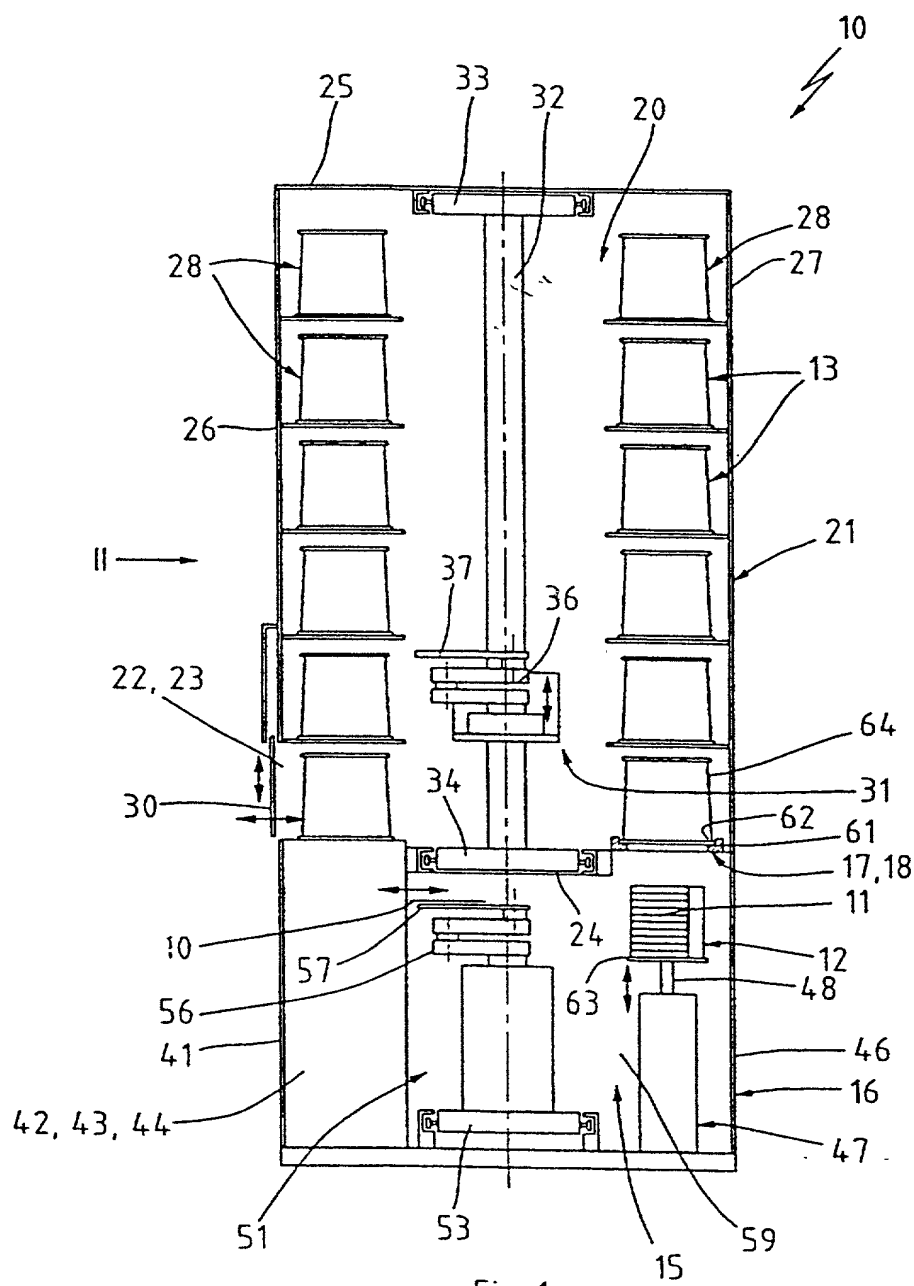


Fig. 1

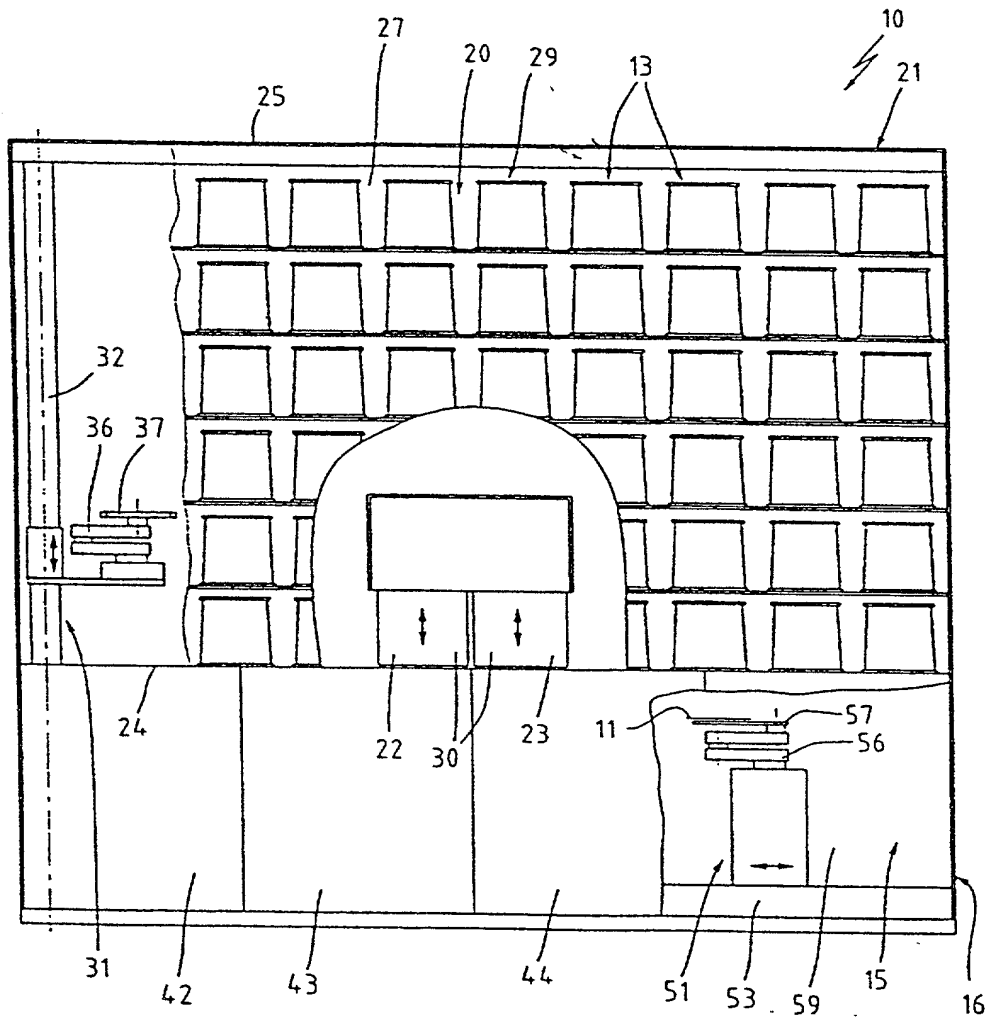
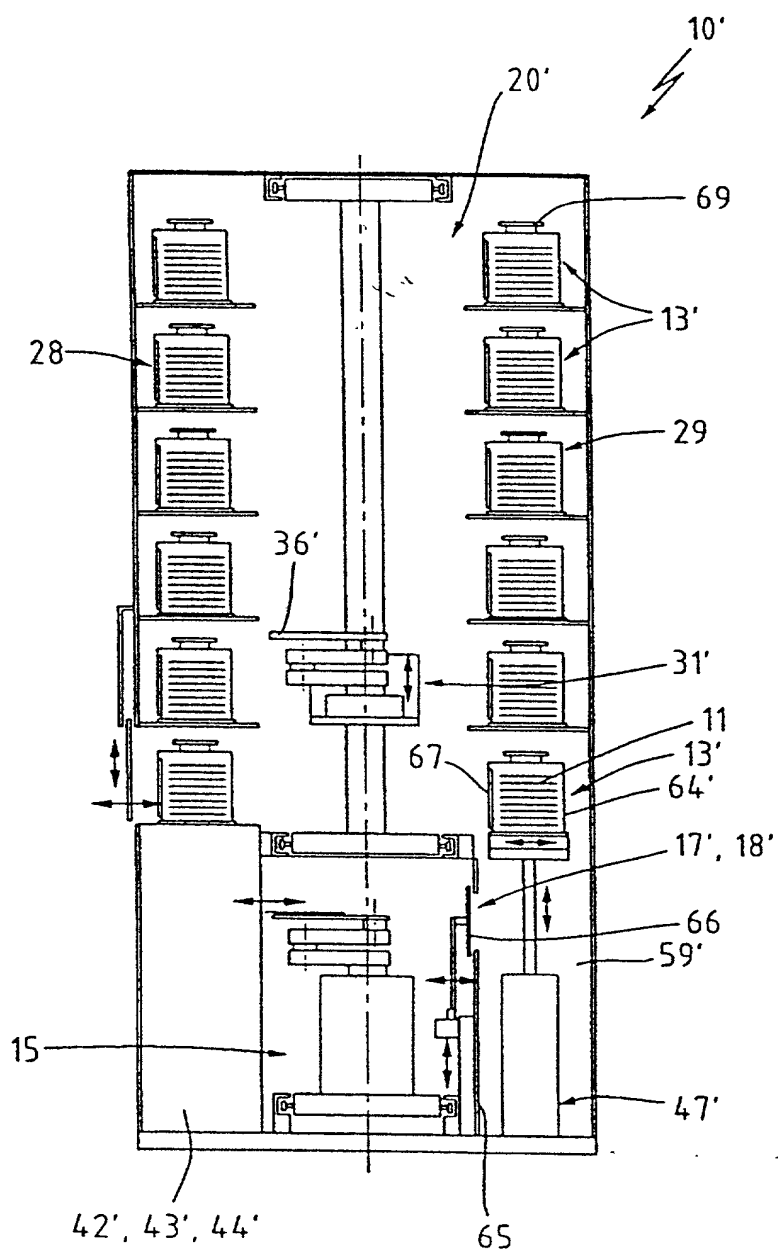


Fig. 2





## DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

### English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Title: DEVICE FOR HANDLING SUBSTRATES INSIDE AND OUTSIDE A CLEAN ROOM

the specification of which

(check one)

☐

is attached hereto.

X

was filed on as United States Application No.10/009,218 or PCT  
International Application Number PCT/EP00/03324 filed on April 13, 2000  
and was amended on (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International Application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

#### Prior Foreign Application(s)

(Number)	(Country)	(Day/Month/Year Filed)	<u>Priority Not Claimed</u>
PCT/EP00/03324	PCT	13 April 2000	<input type="checkbox"/>
DE 19921072.1	Germany	8 May 1999	<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Application Serial No.:

\_\_\_\_\_  
(Filing Date)

I hereby claim the benefit under 35 U.S.C. Section 120 of any United States application(s), or Section 365(c) of any PCT International Application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International Application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number) .

All attorneys listed under Customer No.: 2512

Send Correspondence to:

Customer No.: 2512

Direct Telephone Calls to: (name and telephone number)  
Clarence A. Green, Reg. No.: 24,622 (203) 259-1800

Full name of sole or first inventor:

Wolfgang SCHMUTZ

Sole or first inventor's signature:

DATE

14.07.2002

Residence:

Finkenweg 22, D-78658 Zimmern, Germany

Citizenship:

German

Post Office Address:

Finkenweg 22, D-78658 Zimmern, Germany

Full name of second inventor:

Joseph GENTISCHER

Second inventor's signature:

DATE

14.01.2002

Residence address:

Weinbergweg 31, D-73630 Remshalden, Germany

Citizenship:

German

Post Office Address:

Weinbergweg 31, D-73630 Remshalden, Germany